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ABSTRACT

Thirty-six three and four year olds were given six language-related judgment tasks to identify different features of their metalinguistic awareness. Half of the items in each task were correct, half incorrect. Children exhibited metalinguistic awareness by a criterion of 90% or better correct answers on a task. The easiest task was based on arbitrariness of words (83% of subjects reached criterion), the most difficult on rhymes and speech sounds (30% and 25% to criterion, respectively). Correlation of task scores with age and language development measures revealed that metalinguistic performance correlated very highly with sentence comprehension, vocabulary score, and age. The last correlation, however, was no longer significant when the language measures were partialled out. Since the two language measures were not correlated to each other with age partialled out, it seems that these two aspects of language development make distinct contributions in predicting metalinguistic development. When language measures were correlated with results of individual tasks, it was found that five of the six tasks were related to at least one of the measures (the exception was speech sounds). These results favor the view that emphasizes the interrelatedness between development in comprehension processing and metalinguistics rather than their autonomy. (JB)

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THE RELATIONSHIP BETWEEN LANGUAGE COMPREHENSION AND THE DEVELOPMENT
OF METALINGUISTIC AWARENESS¹

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In analyzing language development, researchers have found it useful to distinguish between the development of the ability to comprehend and produce utterances and the development of the ability to make metalinguistic judgments. The primary focus, then, has been the characterization of the orderly age changes in competence within each of these systems: for example, changes in comprehension abilities which allow children to understand passives, relative clauses and other more complex constructions; and changes in metalinguistic abilities which allow children to make judgments about words, rhymes, and well-formed sentences. Less attention, however, has been paid to how developments in these different systems might interrelate. The purpose of our study was to begin to explore these interrelationships: in particular, the relationship between developments in language comprehension and developments in metalinguistic awareness.

Exactly how could developments in language comprehension be related to developments in metalinguistic awareness? Language researchers are not agreed on this point. Instead, two quite different views of the relation are contained in the current literature. One influential view (espoused, for example, by Foss and Hakes in their current text on psycholinguistics) is that the main developments in comprehension and production proceed essentially independently from developments in metalinguistic awareness; in other words that the two systems are highly autonomous in development.

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According to this view, the two systems should be conceptualized as developing at quite separate times and as involving quite separate abilities. So, for example, Foss and Hakes (1978) argue that the bulk of the development of comprehension and production processes occurs between the ages of 3 and 5 prior to the emergence of linguistic intuitions. Further, they suggest that whereas basic comprehension and production processes call for only pre-operational thought, metalinguistic development calls for concrete operational thought. In particular, they suggest that the ability to decenter is central to the ability to reflect on and make judgments about language. Some support for this view comes from a recent study by Hakes, Evans, and Turner (1976). This study documents the relatively late emergence of the ability to make a variety of metalinguistic judgments (between the ages of 4 and 8) and suggests a relationship between success with these metalinguistic tasks and with Piagetian conservation tasks. However, the metalinguistic judgment tasks which they used were rather complex. Further, no attempt was made to relate metalinguistic development to other aspects of language development during that period.

An alternative view posits a closer relation between developments in comprehension processing and metalinguistic awareness. According to this view, the two systems should be conceptualized as more overlapping in the time of development and as more interacting in the course of development. So, for example, early developments in language comprehension and production may provide a knowledge backdrop for the child's thinking about language and for the child's developing explicit concepts about language. The development of these explicit concepts may in turn affect subsequent language acquisition. Some support for this view comes from the recent work of Eve Clark on the

spontaneous repairs of two and three-year-old children (Clark, 1978; Clark & Anderson, 1979). Her work is important because it suggests that even very young children will show some metalinguistic abilities if you look in the right places; and that one of the right places to look is at what they are doing during normal speech production. Further, de Villiers and de Villiers (1974) report a strong relation between the child's ability to make one type of metalinguistic judgment and his language development as assessed by both comprehension and production measures. In particular, children's ability to correct word order reversed imperatives was related to children's mean length of utterance and comprehension of reversible actives and passives. This study is important because it is one of the few which directly investigates the relationship between the emergence of specific linguistic intuitions and language development.

The purpose of our study was to get further evidence that would help decide between these competing views. These views are important to distinguish for they make quite different claims about the experiences which promote metalinguistic development in children. In one case, metalinguistic development is seen as awaiting the emergence of new cognitive abilities during middle childhood; in the other it is seen as a more direct outgrowth of acquiring linguistic knowledge.

Two specific questions will be addressed in our paper:

1) First, do 3 and 4-year-old children have the ability to make some metalinguistic judgments? We suspect that there is a broader time span for the development of linguistic intuitions than has been commonly supposed, and that preschoolers could show some awareness about phonology, semantics and morphology as well as syntax. In our study we have attempted to simplify ,

some of the phonology and semantics tasks (that have been previously used) to make them potentially more accessible to 3 and 4-year-olds. Further, we have given children a broad range of tasks so that we can look at patterns of performance of individual children to see whether a given child can at least make some metalinguistic judgments. The documentation of the early emergence of a variety of linguistic intuitions would challenge the view tying metalinguistic development to middle childhood.

2) Second, what is metalinguistic development related to? We suspect there should be strong interrelations with other aspects of language development. In our study, we have included one task assessing the development of sentence comprehension and another assessing vocabulary development. In this way we can test whether the principal factor explaining age changes in linguistic intuitions may be the development of different aspects of linguistic knowledge.

More specifically, our study design was as follows. We constructed six tasks to tap different features of young children's metalinguistic awareness. Some are drawn directly from other research, some are adaptations of other tasks, and some are new. The tasks can be divided into three groups of two: phonological judgment tasks, word judgment tasks, and syntactic judgment tasks.

Phonological Judgment Tasks:

1. Speech sounds. The first task was designed to see if children could judge what a speech sound was. We presented a variety of speech sounds (ba, lu, o, etc.) and nonspeech sounds (click, whistle, etc.) and asked the child to judge which were "talking" sounds. In all there were five speech sounds and five nonspeech sounds.

2. Rhymes. Our second phonological task was a rhyming task, which was used successfully by Charles Read with 5-year-olds (Read, 1978). Children had to judge whether a word rhymed with a puppet's name: Jed. There were five words which were rhymes (such as bed, led, etc.) and 5 which were not (e.g., bill, duck).

Word Judgment Tasks:

3. What's a word? The third task was an adaptation of a task first used by Papandropoulou and Sinclair (1974) in French. It is designed to see if children can judge what a word is. In our version, we had an equal number of words (e.g., table, push, three) and nonsense words (pleck, drin, etc.) and had children judge which were the "real" words. We only included nouns, verbs, and adjectives as examples of words (and omitted articles and prepositions) because we were simply interested in assessing whether the child had some concept of a word, not whether he has the full adult concept.

4. Arbitrariness of Words. The fourth task, adapted from a Piagetian task, looked at whether children could conceptualize the arbitrary relationship between a word and its referent. In the Piagetian version, one asks if the moon, for example, could be called the "sun." Although it has been found that young children can accept this name substitution, they now attribute sun-like properties to the moon (see also Markman, 1976). Our modification of this standard task involved substituting a nonsense syllable for a word rather than a related word. For example, we told children we were making up a new language and then asked them if we could call a carrot a "gok" in our new language. After they answered, we then asked four questions about goks, half of which would be true of carrots (e.g., "Can you eat a gok?") and half of which would be false (e.g., "Can goks fly?"). Three additional examples were used.

Syntactic Judgment Tasks:

5. Morphemes: The last two tasks tapped awareness of syntactic well-formedness. In the first, children had to judge whether a puppet had provided the correct or incorrect morphemic ending to a word, e.g., the puppet might say "There are two chairs" or "There are two chairer" in describing a picture.

6. Word Order: In the second, taken from de Villiers and de Villiers (1972), children had to judge correct or incorrect word order of simple imperatives (e.g., "Clap your hands" vs. "Hands your clap.").

In all the tasks, half the items were correct, half incorrect. Within a task the items were presented in a random order. Before each task, we presented examples of both correct and incorrect judgments to help give the child a sense of what the task was about. We used puppets for some tasks to provide a context and maintain the child's interest. The tasks were presented in a counterbalanced order across children. All the children completed the six tasks within approximately a 2-week testing period. In general, two metalinguistic tasks were presented in each testing session.

Finally, we also gave children some measures of language development. We could not use MLU—a production measure—because beyond three years of age it is no longer a useful indicator of language development. Instead we developed a measure of language comprehension and also used the Peabody Picture Vocabulary Test as a measure of vocabulary development. The sentence comprehension measure included 16 different sentence types (reversible actives and passives, phrasal and sentential coordinations, sentences with relative clauses, and so on) which children had to act out on a stage with toy animal props. Children's scores on this test were

based on the number of clauses acted out correctly. To assess vocabulary, the PPVT was administered in standard fashion. Children's scores were simply their raw scores (that is, the total number of words correctly known).

In all, 36 children — 18 3-year-olds and 18 4-year-olds — participated in the study. These children attended day care centers in the Greater Boston area. All the children were native speakers of English with no significant knowledge of a second language.

The first question we can ask is: Can 3 and 4-year-olds make some metalinguistic judgments? The answer is clearly "yes." For each task we set a rigid criterion of success — if there were ten items in a task, then a score of 9 out of 10 or better was considered the criterion of success. 78% of the 3-year-olds reached criterion on at least one task and all of the 4-year-olds did (in fact all the 4-year-olds reached criterion on at least two).

TABLE 1

Percent of Children Passing a Given Number of Metalinguistic Tasks

<u>Age Group</u>	<u>Number of Tasks on Which Child Reached Criterion</u>						
	<u>None</u>	<u>One</u>	<u>Two</u>	<u>Three</u>	<u>Four</u>	<u>Five</u>	<u>Six</u>
3-year-olds	22%	22%	22%	17%	17%	—	—
4-year-olds	—	—	22%	11%	33%	28%	6%

Table 1 shows this breakdown in greater detail—the percent of children passing none, one, two, three, four, five, and six of the tasks. As you

can see, individual 3-year-olds varied from passing none to passing four, with the typical 3-year-old in our sample passing about two. The individual 4-year-olds varied from passing two to all six, with the typical child passing about four. Thus, the majority of children clearly showed some abilities to make metalinguistic judgments; and the number of metalinguistic tasks passed increases with age.

One might wonder at this point which tasks children were passing, and whether some metalinguistic tasks were easier than others. The answer here appears to be that there were some differences in overall difficulty of the different tasks. So, for example, overall, the arbitrariness of words task was the easiest (83% of children reached criterion) and the rhymes and speech sounds were the hardest (30% & 25% reaching criterion, respectively). However we should stress that there were a number of children passing each of the 6 tasks at both age levels. Further, there was no evidence of a strict sequence of acquisition within individual children. Thus, among the children who passed only two tasks, over half had passed one of the two sound tasks.

The second question we can ask is: What is the development of metalinguistic awareness related to? To answer this question, we first computed an overall metalinguistic performance score for each child (simply, over all 6 tasks, the average percent correct for a given child). Then, we examined the correlations between this overall metalinguistic measure, age, and our two other language measures (sentence comprehension and vocabulary scores). Table 2 shows some of the computed correlations. Overall, metalinguistic performance correlated very highly with sentence comprehension (Pearson r of .75), with vocabulary score ($r = .75$), and with age ($r = .72$). However, when we looked at the correlation between

metalinguistic performance and age with the effects of our two language measures partialled out, the correlation was no longer significant. In contrast, the correlation between metalinguistic performance and the language measures remained significant even when age was partialled out. This entire pattern of results is consistent with the hypothesis that it is the linguistic knowledge changes rather than other types of age dependent changes that explains metalinguistic development.

TABLE 2
Correlations of Age, Sentence Comprehension, and Vocabulary
with Overall Metalinguistic Score

<u>Age and Metalinguistics</u>	
a) Overall	.72 (p < .001)
b) With sentence comprehension and vocabulary controlled	.23 N.S.
<u>Sentence Comprehension and Metalinguistics</u>	
a) Overall	.75 (p < .001)
b) With age controlled	.52 (p < .001)
c) With age and vocabulary controlled	.48 (p < .002)
<u>Vocabulary and Metalinguistics</u>	
a) Overall	.75 (p < .001)
b) With age controlled	.49 (p < .001)
c) With age and comprehension controlled	.45 (p < .004)

One interesting aspect of our results was that the two language measures (vocabulary and sentence comprehension) were not themselves significantly correlated when the effects of age were partialled out. Yet each was highly correlated with overall metalinguistic performance and remained significantly correlated when both the effects of age and the other language measures were partialled out (see Table 2). Thus, it would seem that these two aspects of language development make distinct contributions in predicting metalinguistic development.

We also repeated these analyses, relating language measures to the individual metalinguistic tasks rather than the overall metalinguistic score. In this way we could test whether each of the 6 metalinguistic tasks correlated with vocabulary and comprehension measures or whether only some of them did. The correlations between each metalinguistic task and our two language measures were highly significant. Further, when the effects of age were controlled, 4 of the 6 tasks remained significantly correlated with these language measures. The four tasks which remained correlated with sentence comprehension score were: rhymes, what's a word, the arbitrariness of words, and word order (with rhyming showing the strongest relation with sentence comprehension, $r = .51$). The four tasks which remained correlated with vocabulary when the effects of age were controlled were: what's a word, the arbitrariness of words, morphemes, and word order, with the morphemes task showing the highest correlation ($r = .43$). This analysis reveals that 5 of the 6 tasks were related to one of the language measures. The one task which was not was speech sounds. Conceivably, we may need to tell a different story about the pattern of experiences important for the development of concepts relevant to this task (or broaden the range of language measures used). Note, however, the other phonological task—rhyming—was highly correlated with our comprehension measure. Thus, we should not be

too hasty in concluding there is something separate about the development of all aspects of phonological awareness.

In conclusion, our pattern of results favors the view that emphasizes the interrelatedness between developments in comprehension processing and metalinguistics rather than a view that emphasizes their autonomy. We feel that we have demonstrated that between the years 3 and 5 there are important developments in children's linguistic intuitions and hence that there is more overlap in the timing of metalinguistic development with other aspects of language development than has previously been supposed. Further, we have shown that for at least 5 of our 6 metalinguistic tasks there are significant interrelations with other aspects of language development. Our interpretation of these strong correlations is that it is changes in linguistic knowledge as a function of age (rather than other kinds of age-dependent changes in competence) that are primarily responsible for the emergence of linguistic intuitions. One of the interesting challenges for future work is to see whether there is some class of intuitions which departs from this general pattern of interrelatedness or whether this pattern will characterize the whole range of linguistic intuitions that develop through the early and middle childhood years.

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